

We claim:

1. An automatically engageable and releasable brake apparatus adaptable to be attached to a wheelchair, said brake apparatus comprising:
 - a connection mechanism adapted to be positioned on a portion of the wheelchair frame;
 - a seat actuation member adapted to be positioned in communication with a seat of the wheelchair;
 - a brake actuating member in fluid communication with said seat actuation member defining a closed fluid system therewith, said brake actuating member being positioned within said connection mechanism; and
 - a brake member adapted to contact a ground surface on which the wheelchair is located, said brake member being coupled to said connection mechanism,wherein a volume of fluid in said closed fluid system is less than a total volume of said closed fluid system, and wherein occupational ingress into the wheelchair actuates said seat actuation member to cause fluid flow from said seat actuation member to said brake actuating member, which actuates said brake actuating member and causes said brake member to move from a first position in substantial contact with the ground surface on which the wheelchair is located to a second position spaced a distance above the ground surface.
2. The brake apparatus of claim 1, wherein said brake member comprises:
 - a brake shaft member in communication with said brake actuating member, said brake shaft member extending from a first end thereof to an opposed second end thereof, and positioned to extend substantially downwardly from a portion of said connection mechanism proximate said first end of said brake shaft member;
 - and

a friction member positioned proximate said second end of said brake shaft member and adapted to contact a surface on which the wheelchair is located.

3. The brake apparatus of claim 1, wherein said connection mechanism comprises an external surface and an internal surface opposing said external surface to define a substantially enclosed chamber.
4. The brake apparatus of claim 1, wherein said seat actuation member comprises a first fluid cell having a first volume, said brake actuating member comprises a second fluid cell having a second volume, said first fluid cell being in fluid communication with said second fluid cell via a conduit having a third volume, and wherein said first fluid cell, said second fluid cell and said conduit define said closed fluid system.
5. The brake apparatus of claim 4, wherein said brake actuating member further comprises a piston cylinder.
6. The brake apparatus of claim 5, wherein said brake actuating member includes a brake shaft member that is operatively coupled to said piston cylinder.
7. The brake apparatus of claim 4, further comprising a pivot member having a pivot axis and a plate member attached to said pivot member, wherein said pivot member is rotatably coupled to at least one inner surface of said connection mechanism and cooperates with said brake actuating member to move said brake member.
8. The brake apparatus of claim 7, wherein said second fluid cell is positioned within said connection mechanism between a surface of said plate member and a portion of an internal surface of said connection mechanism.

9. The brake apparatus of claim 8, wherein said brake actuating member includes a brake shaft member having a first end coupled to a portion of said pivot member, such that said plate member and said brake shaft member rotate about said pivot member in concert.
10. The brake apparatus of claim 7, further comprising at least one biasing member operatively coupled to said pivot member to bias said pivot member in a first rotation direction toward said first position.
11. The brake apparatus of claim 4, wherein said first fluid cell comprises a plurality of fluid chambers in fluid communication with one another.
12. The brake apparatus of claim 4, wherein said second fluid cell comprises a plurality of fluid chambers in fluid communication with one another.
13. The brake apparatus of claim 12, wherein said plurality of fluid chambers of said second fluid cell are foldably stacked on one another.
14. The brake apparatus of claim 4, wherein said conduit comprises a plurality of branch conduits and wherein said branch conduits are in fluid communication with a corresponding plurality of second fluid cells to define a closed system.
15. The brake apparatus of claim 1, further comprising a pressure regulating member for adjusting an internal pressure of said closed fluid system.
16. The brake apparatus of claim 15, wherein said pressure regulating member is located on a portion of a conduit that provides fluid communication between said seat actuation member and said brake actuating member.

17. The brake apparatus of claim 1, wherein said seat actuation member further comprises a pressure sensor to determine the presence of an occupant in the wheelchair.
18. An automatically engageable and releasable brake apparatus adaptable to be attached to a wheelchair, said brake apparatus comprising:
- a connection mechanism adapted to be attached to a portion of a frame of the wheelchair;
 - a seat actuation member adapted to be positioned in communication with a seat of the wheelchair;
 - a brake actuating member in fluid communication with said seat actuation member and defining a closed fluid system therewith;
 - a brake shaft member in communication with said brake actuating member, said brake shaft member extending from a first end thereof to an opposed second end thereof, and positioned to extend substantially downwardly from a portion of said connection mechanism proximate said first end of said shaft member; and
 - a friction member positioned proximate said second end of said brake shaft member and adapted to contact a surface on which the wheelchair is located;
- wherein a volume of fluid in said closed fluid system is less than a total volume of said closed fluid system, and wherein occupational ingress into the wheelchair actuates said seat actuation member to cause fluid flow from said seat actuation member to said brake actuating member, which actuates said brake actuating member and causes said brake shaft member to move such that said friction member substantially contemporaneously moves from a first position in substantial contact with the surface on which the wheelchair is located to a second position spaced a distance above the surface on which the wheelchair is located.
19. The brake apparatus of claim 18, wherein said seat actuation member comprises a first fluid cell having a first volume, said brake actuating member

comprises a second fluid cell having a second volume, said first fluid cell being in fluid communication with said second fluid cell via a conduit having a third volume, and wherein said first fluid cell, said second fluid cell and said conduit define said closed fluid system.

20. The brake apparatus of claim 18, wherein said brake actuating member further comprises a pivot member having a pivot axis, and a plate member attached to said pivot member, wherein said pivot member is rotatably coupled to at least one inner surface of said connection mechanism and cooperates with said brake actuating member to move said brake member.
21. The brake apparatus of claim 20, wherein said second fluid cell is positioned within said connection mechanism between a surface of said plate member and a portion of an internal surface of said connection mechanism.
22. The brake apparatus of claim 21, wherein said first end of said brake shaft member is coupled to a portion of said pivot member, such that said plate member and said brake shaft member rotate about said pivot member in concert.
23. The brake apparatus of claim 20, wherein further comprising at least one biasing member operatively coupled to said pivot member to bias said pivot member in a first rotation direction toward said first position.
24. The brake apparatus of claim 18, further comprising a pressure regulating member for adjusting an internal pressure of said closed fluid system.
25. The brake apparatus of claim 18, wherein said seat actuation member further comprises a pressure sensor to determine the presence of an occupant in the wheelchair.

26. An automatically engageable and releasable brake apparatus adaptable to be attached to a wheelchair, said brake apparatus comprising:

- a connection mechanism adapted to be attached directly to a portion of the wheelchair frame proximate a rear wheel of the wheelchair, said connection mechanism having an external surface and an internal surface defining a substantially enclosed chamber;

- a seat actuation member adapted to be positioned in communication with a seat of the wheelchair, said seat actuation member comprising a first fluid cell having a volume;

- a brake actuating apparatus positioned within said chamber of said connection mechanism, said brake actuating apparatus comprising

 - a second fluid cell having a second volume, said second fluid cell being in fluid communication with said first fluid cell via a conduit having a third volume to define a closed fluid system having a total volume,

 - a pivot member rotatably coupled to said internal surface of said connection mechanism,

 - a plate member positioned adjacent said second fluid cell, said plate member having a first surface and an opposed second surface and extending longitudinally from a first end to an opposed second end, said plate member being substantially fixedly coupled to said pivot member proximate said second end of said plate member,

 - a brake shaft member extending longitudinally from a first end to a second end thereof, said brake shaft member positioned to extend substantially downwardly from a portion of said connection mechanism proximate said first end of said brake shaft member, said first end of said brake shaft member being substantially fixedly coupled to said pivot member, and

 - a friction member positioned proximate said second end of said brake shaft member and adapted to contact a surface on which the wheelchair is located; and

a fluid contained within said closed system defined by said first fluid cell, said second fluid cell and said conduit, said fluid having a volume that is less than said total volume of said closed fluid system;

wherein occupational ingress of the wheelchair causes an increase in pressure within said first fluid cell and causes a displaced volume of fluid in said first fluid cell to translocate to said second fluid cell, which in turn increases the volume of fluid in said second fluid cell and causes said second fluid cell to expand and rotate said plate member about said pivot member and cause said brake shaft member to rotate and move said friction member from a first position in substantial contact with the surface on which the wheelchair is located to a second position spaced a distance above the surface on which the wheelchair is located.

27. An automatically engageable and releasable brake apparatus adaptable to be attached to a wheelchair, said brake apparatus comprising:

a seat actuation member;

a brake actuating member in fluid communication with said seat actuation member and defining a closed fluid system therewith; and

a brake member in communication with said brake actuating member;

wherein actuation of said seat actuation member activates said brake actuating member which causes said brake member to move from a first position which prevents any significant rearward motion of the wheelchair to a second position which allows substantially unrestricted rearward motion of the wheelchair.

28. A wheelchair comprising:

a frame;

a seat member incorporated into and substantially supported by said frame;

a wheel assembly having a plurality of first wheels rotatably connected proximate a front end of said frame, and a plurality of second wheels rotatably connected proximate a rear portion of said frame; and

an automatically engageable and releasable brake apparatus attached to said rear portion of said frame, said brake apparatus comprising

a connection mechanism attached to said rear portion of said frame,
a seat actuation member positioned in communication with said seat

member,

a brake actuating member in fluid communication with said seat actuation member defining a closed fluid system therewith, said brake actuating member being positioned within said connection mechanism, and

a brake member adapted to contact a ground surface on which said wheelchair is located, said brake member being coupled to said connection mechanism;

wherein occupational ingress into said wheelchair actuates said seat actuation member to cause fluid flow from said seat actuation member to said brake actuating member, which actuates said brake actuating member and causes said brake member to move from a first position in substantial contact with the ground surface on which said wheelchair is located to a second position spaced a distance above the ground surface.

29. A wheelchair comprising:

a frame;

a seat member incorporated into and substantially supported by said frame;

a wheel assembly having a plurality of first wheels rotatably connected proximate a front end of said frame, and a plurality of second wheels rotatably connected proximate a rear portion of said frame; and

an automatically engageable and releasable brake apparatus attached to said rear portion of said frame, said brake apparatus comprising:

a connection mechanism attached to said rear portion of said frame,
 a seat actuation member positioned in communication with said seat member,

a brake actuating member in fluid communication with said seat actuation member and defining a closed fluid system therewith,

a brake shaft member in communication with said brake actuating member, said brake shaft member extending from a first end thereof to an opposed second end thereof, and positioned to extend substantially downwardly from a portion of said connection mechanism proximate said first end of said shaft member, and

a friction member positioned proximate said second end of said brake shaft member and adapted to contact a surface on which the wheelchair is located;

wherein occupational ingress into said wheelchair actuates said seat actuation member to cause fluid flow from said seat actuation member to said brake actuating member, which causes said brake shaft member to move such that said friction member substantially contemporaneously moves from a first position in substantial contact with the surface on which said wheelchair is located to a second position spaced a distance above the surface on which said wheelchair is located.

30. A wheelchair comprising:

a frame;

a seat member incorporated into and substantially supported by said frame;

a wheel assembly having a plurality of first wheels rotatably connected proximate a front end of said frame, and a plurality of second wheels rotatably connected proximate a rear portion of said frame; and

an automatically engageable and releasable brake apparatus attached to said rear portion of said frame, said brake apparatus comprising:

a connection mechanism having an external surface and an internal surface defining a substantially enclosed chamber,

a seat actuation member positioned in communication with said seat member, said seat actuation member comprising a first fluid cell having a volume,

a brake actuating apparatus positioned within said chamber of said connection mechanism, said brake actuating apparatus comprising:

a second fluid cell having a second volume, said second fluid cell being in fluid communication with said first fluid cell via a conduit having a third volume to define a closed fluid system having a total volume,

a pivot member rotatably coupled to said internal surface of said connection mechanism, and

a plate member positioned adjacent said second fluid cell, said plate member having a first surface and an opposed second surface and extending longitudinally from a first end to an opposed second end, said plate member being substantially fixedly coupled to said pivot member proximate said second end of said plate member;

a brake shaft member extending longitudinally from a first end to a second end thereof, said brake shaft member positioned to extend substantially downwardly from a portion of said connection mechanism proximate said first end of said brake shaft member, said first end of said brake shaft member being substantially fixedly coupled to said pivot member,

a friction member positioned proximate said second end of said brake shaft member and adapted to contact a surface on which said wheelchair is located, and

a fluid contained within said closed system defined by said first fluid cell, said second fluid cell and said conduit, said fluid having a volume that is less than said total volume of said closed fluid system;

wherein occupational ingress into said wheelchair causes an increase in pressure within said first fluid cell and causes a displaced volume of fluid in said

first fluid cell to translocate to said second fluid cell, which in turn increases the volume of fluid in said second fluid cell and causes said second fluid cell to expand and rotate said plate member about said pivot member and cause said brake shaft member to rotate and move said friction member from a first position in substantial contact with the surface on which said wheelchair is located to a second position spaced a distance above the surface on which said wheelchair is located.

31. A wheelchair comprising:

a frame;

a seat member incorporated into and substantially supported by said frame;

a wheel assembly having a plurality of first wheels rotatably connected proximate a front end of said frame, and a plurality of second wheels rotatably connected proximate a rear portion of said frame; and

an automatically engageable and releasable brake apparatus attached to said rear portion of said frame, said brake apparatus comprising:

a seat actuation member,

a brake actuating member in fluid communication with said seat actuation member and defining a closed fluid system therewith, and

a brake member in communication with said brake actuating member;

wherein actuation of said seat actuation member activates said brake actuating member which causes said brake member to move from a first position which prevents any significant rearward motion of said wheelchair to a second position which allows substantially unrestricted rearward motion of said wheelchair.